



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,381	03/04/2002	Stephen D. Senturia	P00743/70003	5189
23628	7590	10/05/2005	EXAMINER	
WOLF GREENFIELD & SACKS, PC FEDERAL RESERVE PLAZA 600 ATLANTIC AVENUE BOSTON, MA 02210-2211			BELLO, AGUSTIN	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 10/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/090,381

Applicant(s)

SENTURIA, STEPHEN D.

Examiner

Agustin Bello

Art Unit

2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-14 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boord (U.S. Patent No. 6,647,209) in view of Castracane (U.S. Patent No. 5,999,319).

Regarding claims 1 and 12, Boord teaches a reflective diffracting optical element (reference numeral 27 in Figure 1) having a plurality of grating elements forming a plurality of pixels, each pixel configurable to direct a corresponding one of the plurality of optical carriers along a main pathway (inherent function of the grating taught by Boord); an optical source located off the main pathway (reference numeral 20 in Figure 1), positioned to direct an optical carrier to be added onto one of the plurality of pixels of grating elements, the one of the plurality of pixels configurable to diffract at least a portion of the optical carrier to be added into the main pathway; Boord differs from the claimed invention in that Boord fails to specifically teach a controller coupled to the reflective diffracting optical element to configure the plurality of pixels. However, controllers of this type are well known in the art. Castracane, in the same field of optics, teaches it is these types of controlled gratings are well known in the art (column 2 lines 4-9). One skilled in the art would have been motivated to employ the type of grating taught by Castracane in the device of Boord in order to allow the diffracted power among individual diffraction orders of wavelengths to be altered (column 2 lines 21-26). Therefore, it would have

Art Unit: 2633

been obvious to one skilled in the art at the time the invention was made to employ a diffraction grating such as that taught by Castracane in the device of Boord in order to allow the diffracted power among individual diffraction orders of wavelengths to be altered.

Regarding claims 2 and 13-14, the combination of references and Castracane in particular teaches a substrate, and a plurality of actuating beams supported over the substrate, each of the plurality of actuating beams supporting a corresponding one of the grating elements over the substrate and forming an auxiliary gap, the plurality of actuating beams and the plurality of grating elements configured such that a displacement of at least one of the plurality of actuating beams toward the substrate causes the corresponding one of the reflective grating elements to be displaced toward the substrate (Figure 3, 4; column 2 lines 15-21).

Regarding claim 3, Boord teaches that the optical source is an optical fiber (reference numeral 20 in Figure 1).

Regarding claim 4, the combination of references teaches that the portion of the optical carrier to be added is a first order diffraction of the optical carrier to be added (column 5 lines 19-41).

Regarding claim 5, the combination of references teaches a demultiplexer optically coupled to the reflective diffracting optical element to achieve spatial separation of the plurality of optical carriers and to project the plurality of optical carriers onto the plurality of pixels of the reflective diffracting optical element (reference numerals 21-25 in Figure 1 of Boord).

Regarding claim 6, the combination of references teaches a reflective diffracting optical element controllable to diffract a first optical carrier along a main pathway, the diffracting optical element having a plurality of parallel grating elements, adjacent grating elements of said

Art Unit: 2633

plurality of grating elements separated by a corresponding one of a plurality of gaps, the plurality of gaps diffracting a portion of the first optical carrier at an angle to the main pathway (as discussed in the rejection of claim 1); and a first detector positioned to receive the portion of the first optical carrier (reference numerals 29-33 in Figure 1 of Boord).

Regarding claim 7, the combination of references teaches an optical element to direct the portion of the first optical carrier to the first detector (reference numerals 29-33 in Figure 1 of Boord).

Regarding claim 8, the combination of references that the plurality of gaps diffracts a portion of a second optical carrier (as seen in Figure 1 of Boord).

Regarding claim 9, the combination of references teaches a dispersive optical element (reference numeral 32 in Figure 1 of Boord) positioned to receive the portion of the first optical carrier and the portion of the second optical carrier from the reflective diffracting optical element, and to increase spatial separation between the portion of the first optical carrier and the portion of the second optical carrier, the dispersive optical element directing the portion of the first optical carrier to the first detector.

Regarding claim 10, the combination of references teaches a second detector positioned to receive the portion of the second optical carrier (e.g. second fiber of reference numeral 33 in Figure 1 of Boord).

Regarding claim 11, the combination of references teaches an actuator to sequentially direct the portion of the first optical carrier and the portion of the second optical carrier to the first detector (reference numeral 100 in Figure 3 of Castracane).

***Response to Arguments***

3. Applicant's arguments filed 6/30/05 have been fully considered but they are not persuasive. The applicant's main point of contention against the rejection made by the examiner is that the cited references, either alone or in combination, fail to teach an optical source from which light is added onto one of the plurality of pixels of the grating elements located off the main pathway. However, the examiner disagrees. Boord, in the examiner's opinion, clearly teaches this limitation in that the examiner has considered the pathway created by elements 28-33 in Figure 1 as representing the main pathway. Given this interpretation of Boord, should be clear to the applicant that light source 20 in Figure 1 of Boord is indeed located off of the main pathway created by serial elements 28-33 in Figure 1. As such, the examiner maintains the rejection of the claimed invention based on the combination of Boord and Castracane.

***Conclusion***

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 2633

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (571) 272-3026. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571)272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AB

  
**AGUSTIN BELLO**  
**PATENT EXAMINER**